



Membership Meeting – Sept. 2022
September 21, 2022
Fond du Lac, Wisc.

Roofing industry technical issue update

presented by

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STATEMENT OF SCOPE
Department of Safety & Professional Services

Rule No.: SPS 303, 305, 314, 316, 318, 340, 341, 343, 345, 361-366, 367-372, 375-379, and 381-387

Relating to: Commercial Building Code

Rule Type: Permanent

1. Finding/nature of emergency:
N/A

2. Detailed description of the objective of the proposed rule:
The primary objective of this rulemaking project is to evaluate and update the Wisconsin Commercial Building Code, chapters SPS 361-366. This rulemaking update is intended to keep this Code consistent with dynamic, contemporary regional and national construction and fire prevention practices and standards, and with legislation enacted since the previous update of this Code. The update is also needed in order to meet the content and timeliness requirements for the energy conservation provisions of this Code as established in sections 101.027 (2) and (3) of the Wisconsin Statutes.

In addition, the project is expected to evaluate other administrative codes of the Department that may be affected by this update of the Wisconsin Commercial Building Code, including at least chapters SPS 303, 305, 314, 316, 318, 340, 343, and 345, relating to administrative procedures; licenses, certifications and registrations; fire prevention; electrical, elevators, escalators, and lift devices; gas systems; boilers and pressure vessels; anhydrous ammonia; mechanical refrigeration; rental unit energy efficiency; solar energy systems; cleaning methods for historic buildings; buildings constructed prior to 1914; and plumbing, respectively. This evaluation may result in changes and updates of the rules in these chapters. The objectives of this rule project may be incorporated into one or more rule packages.

3. Description of the existing policies relevant to the rule, new policies proposed to be included in the rule, and an analysis of policy alternatives:
The Wisconsin Commercial Building Code contains standards for the design, construction, use, maintenance, alteration, and inspection of public buildings and places of employment. This Code currently generally incorporates by reference the 2015 edition of the national-level model building code suite produced by the International Code Council (ICC)[®]. This suite includes the International Building Code[®] (IBC[®]), the International Energy Conservation Code[®] (IECC[®]), the International Mechanical Code[®] (IMC[®]), the International Fuel Gas Code[®] (IFGC[®]), and the International Existing Buildings Code[®] (IEBC[®]); with some exceptions deemed prudent by the department or as required due to state statutes.

The primary purpose of the codes under consideration is to protect public safety, health, and welfare. Periodic review and update of these codes is necessary to ensure that they still achieve that purpose. In addition, the review and update allows the opportunity to recognize and stay current with new construction products and practices. The review and update under this scope statement will include evaluation of the 2018 and 2021 editions of the above-mentioned model building code suite for

[Link](#)

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Publications	
Document	Description
SBD-10115-P	Brochure for Building Plan Review and Inspection Under Wisconsin's Commercial Building and Heating Codes
SBD-10882	Carbon Monoxide Detector / Alarms in Multi-Unit Residential Brochure
SBD-10512	Lighting Compliance Forms
Minimum Locations	Minimum Carbon Monoxide Detector / Alarm Locations in Multi-Unit Residential Buildings
SBD-10715	Information on State Building Plan Review Requirements Before Municipalities Issue Permits (for posted by municipalities)
HVAC Contractor Memo	Memo to HVAC Contractors Regarding Equipment Installations
Kitchen Hood PowerPoint	Kitchen Hood Installation and Replacement Presentation to Spring 2010 Inspector Updates
Catastrophic Loss	Catastrophic Loss
Wedding Barn Information	Wedding/Event Barn Information
SPS 361 Insert	Substitute SPS 361 for International Building Code Chapter 1
SPS 362 Insert	International Building Code, 2015, SPS 362 Wisconsin insert pages
SPS 363 Insert	International Energy Conservation Code, 2015, SPS 363 Wisconsin insert pages
SPS 364 Insert	International Mechanical Code, 2015, Wisconsin SPS 364 insert pages
SPS 365 Insert	International Fuel Gas Code, 2015, Wisconsin SPS 365 insert pages
SPS 366 Insert	International Existing Building Code, 2015, Wisconsin SPS 366 insert pages

[Link](#)

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Insert pages for May 1, 2018 Wisconsin Commercial Building Code, SPS 361 – SPS 366, into the International Building Code, 2015 Edition

Wisconsin Department of Safety and Professional Services- Division of Industry Services

IBC Chapter 15, Insert 15D, Page 1 of 1

Insert between pages 336 and 337

SPS 362.1507 Roof slope.

(1) This is a department exception to the requirements in IBC section 1507.12.1: Thermo- set single-ply membrane roofs may have a design slope of less than 2 percent, if permitted by the manufacturer's literature or listing criteria.

(2) This is a department exception to the requirements in IBC section 1507.13.1: Thermoplastic single-ply membrane roofs may have a design slope of less than 2 percent, if permitted by the manufacturer's literature or listing criteria.

(3) This is a department exception to the requirements in IBC section 1507.14.1: Sprayed polyurethane foam roofs may have a design slope of less than 2 percent, if permitted by the manufacturer's literature or listing criteria.

(4) This is a department exception to the requirements in IBC section 1507.15.1: Liquid-applied roofs may have a design slope of less than 2 percent, if permitted by the manufacturer's literature or listing criteria.

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Insert pages for May 1, 2018 Wisconsin Commercial Building Code, SPS 361 – SPS 366, into the International Energy Conservation Code, 2015 Edition

Wisconsin Department of Safety and Professional Services- Division of Industry Services

IECC Chapter 4, Insert 4B[CE], Page 1 of 1
Insert between pages C-30 and C-31

SPS 363.0402 Building envelope requirements.
(1) OPAQUE ASSEMBLIES. Substitute 2009 IECC Table 502.2 (1) for 2015 IECC Table C402.1.3 and renumber Table C402.1.3.
(2) OPAQUE ELEMENT MAXIMUM U-FACTORS. Substitute 2009 IECC Table 502.1.2 for 2015 IECC Table C402.1.4 and renumber Table C402.1.4.

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**TABLE 502.2(1)
BUILDING ENVELOPE REQUIREMENTS - OPAQUE ASSEMBLIES**

CLIMATE ZONE	1		2		3		4 EXCEPT MARINE		5 AND MARINE 4		6		7		8		
	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	All other	Group R	
Roofs																	
Insulation entirely above deck	R-15ci	R-20ci	R-20ci	R-20ci	R-20ci	R-20ci	R-20ci	R-20ci	R-20ci	R-20ci	R-20ci	R-20ci	R-20ci	R-25ci	R-25ci	R-25ci	R-25ci
Metal buildings (with R-5 thermal blocks ^{a, b})	R-19	R-19	R-13 + R-13	R-13 + R-13	R-13 + R-13	R-19	R-13 + R-13	R-19	R-13 + R-13	R-19	R-13 + R-19	R-19	R-19	R-13 + R-19	R-19 + R-10	R-11 + R-19	R-19 + R-10
Attic and other	R-30	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-38	R-49	R-49	R-49

Member	1	2	3	4	5	6	7	8
Walls, Below Grade								
Below grade wall ^d	NR	NR	NR	NR	NR	NR	R-7.5ci	R-7.5ci
Floors								
Mass	NR	NR	R-6.3ci	R-8.3ci	R-6.3ci	R-8.3ci	R-10ci	R-10.4ci
Joist/Framing (steel/wood)	NR	NR	R-19	R-30	R-19	R-30	R-30	R-30
Slab-on-Grade Floors								
Unheated slabs	NR	NR	NR	NR	NR	NR	R-10 for 24 in. below	R-10 for 24 in. below
Heated slabs	R-7.5 for 12 in. below	R-7.5 for 12 in. below	R-7.5 for 12 in. below	R-7.5 for 12 in. below	R-10 for 24 in. below	R-10 for 24 in. below	R-15 for 24 in. below	R-15 for 24 in. below
Opaque doors	U-0.70	U-0.70	U-0.70	U-0.70	U-0.70	U-0.70	U-0.70	U-0.70
Swinging	U-0.70	U-0.70	U-0.70	U-0.70	U-0.70	U-0.70	U-0.70	U-0.70
Roll-up or sliding	U-1.45	U-1.45	U-1.45	U-1.45	U-1.45	U-1.45	U-0.50	U-0.50

For SI: 1 inch = 25.4 mm.
ci = Continuous insulation, NR = No requirement.
a. When using R-value compliance method, a thermal spacer block is required, otherwise use the U-factor compliance method. [see Tables 502.1.2 and 502.2(2)].
b. Assembly descriptions can be found in Table 502.2(2).
c. R-5.7 (ci) is allowed to be substituted with concrete block walls complying with ASTM C 90, ungrouted or partially grouted at 32 inches or less on center vertically and 48 inches or less on center horizontally, with ungrouted cores filled with material having a maximum thermal conductivity of 0.44 Btu-in./hr. °F.
d. When heated slabs are placed below grade, below-grade walls must meet the exterior insulation requirements for perimeter insulation according to the heated slab-on-grade construction.
e. Steel floor joist systems shall be R-38.

COMMERCIAL ENERGY EFFICIENCY

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WISCONSIN STATE LEGISLATURE

HOME SENATE ASSEMBLY COMMITTEES SERVICE AGENCIES DOCS OPTIONS HELP

Menu Administrative Rules Related Administrative Code Department of Safety and Professional Services (SPS)
 Chs. SPS 301-399; Safety, Buildings, and Environment Chs. SPS 320-325; Uniform Dwelling Code

- Chapter SPS 320 (PDF) - Administration And Enforcement
- Chapter SPS 321 (PDF) - Construction Standards
- Chapter SPS 322 (PDF) - Energy Conservation
- Chapter SPS 323 (PDF) - Heating, Ventilating And Air Conditioning
- Chapter SPS 324 (PDF) - Electrical Standards
- Chapter SPS 325 (PDF) - Plumbing
- Chapter SPS 325 Appendix A (PDF) - UDC Appendix A
- Chapter SPS 325 Appendix B (PDF) - UDC Appendix B
- Chapter SPS 325 Appendix C (PDF) - UDC Appendix C

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SPS 321.28 Weather protection for roofs.

(1) GENERAL.

(a) All roofs shall be designed and constructed to assure drainage of water.

(b) All fasteners shall be corrosion resistant.

(2) UNDERLAYMENT FOR SHINGLES. Underlayment consisting of number 15 asphalt-impregnated felt paper or equivalent or other type I material that shows no water transmission when tested in accordance with ASTM D 226 or ASTM D 4869 shall be provided under shingles.

Note: Underlayment materials meeting the requirements of ASTM D 1970 meet the performance requirements of this section.

(3) ASPHALT SHINGLES.

(a) General.

1. Shingles that have a self-sealing adhesive strip shall include a sealant which has an average bond strength of at least 1.5 pounds per 3.75 inches of shingle width, at 32°F.
- Note: The department will accept results of testing conducted in accordance with an approved test method for verifying compliance with the sealant uplift resistance required in this paragraph. Information on the applicable test method may be obtained from the department.
2. Each shingle package shall be labeled by the manufacturer to indicate conformance to the applicable ASTM standard for each type of shingle or the exception in par. (c).
3. Shingles shall be installed in accordance with the manufacturer's recommendations.
4. Shingles shall have at least 4 fasteners per strip shingle or 2 fasteners per interlocking shingle, unless the manufacturer has other specifications.
5. Shingle head lap shall be at least 2 inches, unless the manufacturer has other specifications.
6. All fasteners for shingles shall be corrosion-resistant.
- Note: See s. SPS 320.07 (62) for definitions of shingle terms.
- Note: Section SPS 320.04 (2) requires compliance with all parts of this code, including these roofing provisions, for an alteration to any dwelling that is regulated under this code.

(c) *Fiberglass shingles.* Fiberglass asphalt shingles shall conform to ASTM D 3462 except that laminated shingles shall have a tear strength of at least 1450 grams in each ply.

(4) ICE DAM PROTECTION.

(a) Shingled or shake roofs that extend over a heated area of a dwelling or attached garage and that have a slope of 4:12 or less shall be provided with ice dam protection in the form of sheet metal or a product labeled as meeting the requirements of ASTM D 1970.

(b) The ice dam protection shall extend at least 30 inches up the roof slope from the roof edge and at least 12 inches up the roof slope beyond the inner face of the exterior wall.

(5) OTHER ROOF COVERINGS. All roof coverings not otherwise addressed in this section shall be installed in accordance with the manufacturer's instructions or a national standard recognized by the department.

(6) REROOFING. New roof coverings may not be installed over existing roof coverings where any of the following conditions exist:

- (a) The existing roof or roof covering is water-soaked or has deteriorated such that it is inadequate as a base for additional roofing.
- (b) The existing roof is wood shake, slate, clay, cement or asbestos-cement tile.
- (c) The existing roof has 2 or more applications of any type of permanent roof covering.

(7) FLASHING.

(a) General. Flashing shall be installed at the junction of chimneys and roofs, in all valleys, and around all roof openings.

(b) *Flashing of open valleys.*

1. Open valleys shall be flashed with at least No. 28 gauge corrosion-resistant sheet metal, 16 inches wide, or a layer of at least 50-pound roll roofing, 16 inches wide, placed over a layer of number 15 roofing underlayment.
2. Flashing sections shall be overlapped by at least 4 inches.

(c) *Flashing of closed valleys.* Where shingles are laced or woven over the valley, the valley shall be flashed with one of the following:

1. At least one layer of 50-pound roofing, at least 20 inches wide, over a layer of number 15 roofing underlayment.
2. A product labeled as meeting the requirements of ASTM D1970.

(d) *Chimney flashing*

1. Chimneys shall be flashed and counter-flashed to a height of at least 6 inches.

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ICC codes accessible online

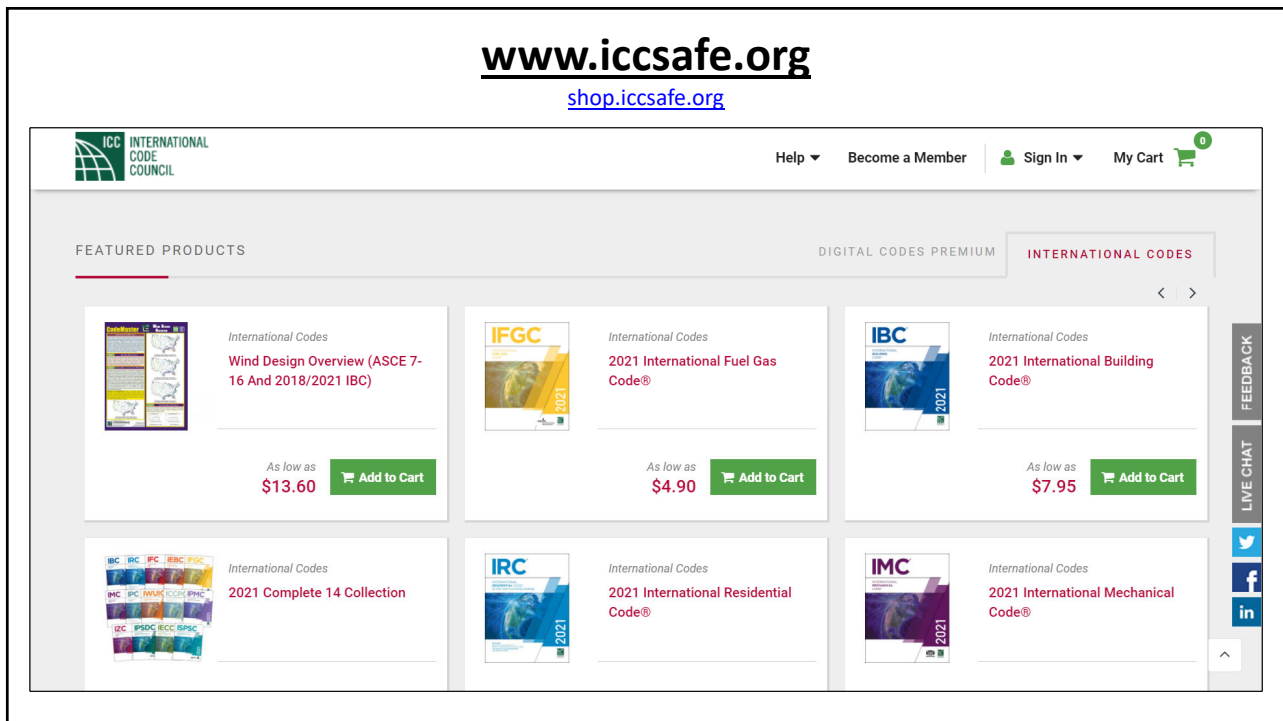
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RESEARCH+TECH



Roofing coatings and code compliance
The latest International Building Code® provides clearer guidance
by Mark S. Graham

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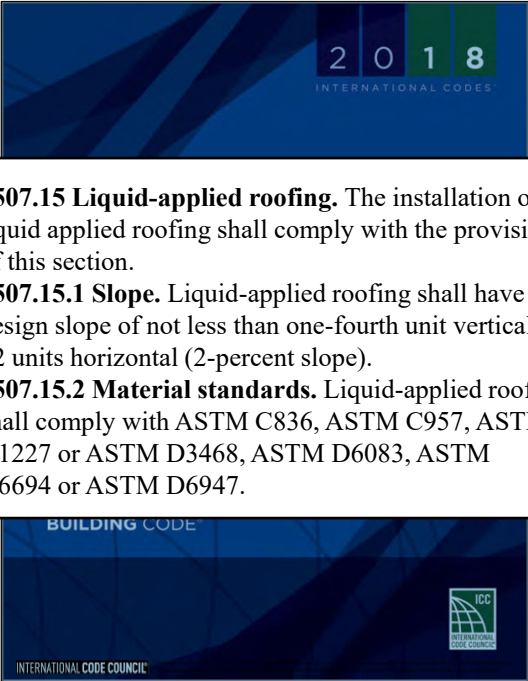
September 2022

Until the publication and adoption of the *International Building Code, 2021 Edition*, building code requirements for roof coating products and applications were somewhat vague and sometimes led to inconsistent interpretations. Beginning with IBC 2021, the code's requirements for roof coatings became clearer and more streamlined, which means interpretations should now be more consistent and what is required of roof coating manufacturers and roofing contractors involved in roof coating applications should be better defined.

Previous editions
 In IBC's previous editions, code requirements for roof coatings are addressed in the sections addressing built-up membrane roof systems, spray polyurethane foam roof systems and liquid-applied membrane roof systems. As a result, it has sometimes been unclear which of these sections' requirements apply to new applications of membrane and SPF roof systems and which apply to roof coating applications. Beginning with IBC 2018 and the *International Residential Code, 2018 Edition*, a clarifying statement was added indicating the

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1507.15 Liquid-applied roofing. The installation of liquid applied roofing shall comply with the provisions of this section.

1507.15.1 Slope. Liquid-applied roofing shall have a design slope of not less than one-fourth unit vertical in 12 units horizontal (2-percent slope).

1507.15.2 Material standards. Liquid-applied roofing shall comply with ASTM C836, ASTM C957, ASTM D1227 or ASTM D3468, ASTM D6083, ASTM D6694 or ASTM D6947.


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1507.14 Liquid-applied roofing. The installation of liquid applied roofing shall comply with the provisions of this section.

1507.14.1 Slope. Liquid-applied roofing shall have a design slope of not less than 1/4 unit vertical in 12 units horizontal (2-percent slope).

1507.14.2 Material standards. Liquid-applied roofing shall comply with ASTM C836, ASTM C957 or ASTM D3468.



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**SECTION 1509
ROOF COATINGS**

1509.1 General. The installation of a *roof coating* on a *roof covering* shall comply with the requirements of Section 1505 and this section.

1509.2 Material standards. Roof coating materials shall comply with the standards in Table 1509.2.

**TABLE 1509.2
ROOF COATING MATERIAL STANDARDS**

MATERIAL	STANDARD
Acrylic coating	ASTM D6083
Asphaltic emulsion coating	ASTM D1227
Asphalt coating	ASTM D2823
Asphalt roof coating	ASTM D4479
Aluminum-pigmented asphalt coating	ASTM D2824
Silicone coating	ASTM D6694
Moisture-cured polyurethane coating	ASTM D6947



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A liquid-applied roofing is a roof assembly for fire resistance and wind-uplift resistance purposes

A roof coating is a product for fire resistance purposes

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Questions
Pre-submitted

Can you please explain the relationship between FM 4450 and NFPA 276? Building Code references NFPA 276, but manufacturers (and PIMA) only list information for FM 4450.

Also, can you please discuss if and when a thermal barrier would be required over an acoustical steel deck (with foam plastic in the roofing assembly)? Some acoustical decks claim to meet FM approvals as steel roof decks. How do we know this when bidding a project?

What do you think the roofing industry will look like in 2-3 years? Will we experience a backlash with suppliers increasing production with and a future reduction in demand?

Can you summarize the code changes for coatings?

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**SECTION 1508
ROOF INSULATION**

[BF] 1508.1 General. The use of above-deck thermal insulation shall be permitted provided that such insulation is covered with an approved *roof covering* and passes the tests of [NFPA 276](#) or [UL 1256](#) when tested as an assembly.

Exceptions:

1. Foam plastic roof insulation shall conform to the material and installation requirements of Chapter 26.
2. Where a concrete or composite metal and concrete roof deck is used and the above-deck thermal insulation is covered with an approved *roof covering*.

[BF] 1508.2 Material standards. Above-deck thermal insulation board shall comply with the standards in Table 1508.2.

**[BF] TABLE 1508.2
MATERIAL STANDARDS FOR ROOF INSULATION**

Cellular glass board	ASTM C552
Composite boards	ASTM C1289, Type III, IV, V or VII
Expanded polystyrene	ASTM C578
Extruded polystyrene	ASTM C578
Fiber-reinforced gypsum board	ASTM C1278
Glass-faced gypsum board	ASTM C1177
High-density polyisocyanurate board	ASTM C1289, Type II, Class 4
Mineral fiber insulation board	ASTM C726
Perlite board	ASTM C728
Polyisocyanurate board	ASTM C1289, Type I or II
Wood fiberboard	ASTM C208, Type II

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Document Related Information

Roof Deck Constructions

[Guide Information for Roofing Materials and Systems](#)

Roof deck constructions illustrated and described in this category are identified by a construction number and evaluated as to the spread of fire on the underside and/or resistance to uplift forces.

FIRE CLASSIFIED

Fire Classified Constructions are evaluated by either the large-scale fire test, or other test procedures having fire exposure conditions related to the large-scale fire test, described in the [Standard for Fire Test of Roof Deck Constructions, ANSI/UL 1256](#).

These Fire-Classifications are not related to Fire ratings under either the Surface Burning Characteristics or the Fire Resistance Classification. The Surface Burning Characteristics is a comparative evaluation of materials (occasionally with facings or backing) with respect to flame spread and smoke developed. The Fire Resistance Classification is the time rating of an assembly with respect to resistance to flame passage, heat transfer and maintenance of structural integrity.

Roof deck constructions which are Fire-Classified consist of assemblies of materials as illustrated and described in this category, classified on the basis of specific requirements for maximum flame spread on the underside of the assembly within definite time limits. These constructions differ from materials classified with respect to Surface Burning Characteristics in that in the latter, materials are assigned comparative numerical values. They also differ from assemblies classified with respect to Fire Resistance, since temperature transmission through roof deck constructions and structural performance under load are not measured nor are time ratings assigned.

A fire investigation of a roof deck construction primarily determines whether the contribution to an igniting fire by any or all of the materials in the assembly is at a sufficient rate to cause propagation of flame on the underside, in excess of the established limits.

As indicated in individual Classifications, specific materials have been supplementally fire tested in accordance with the requirements of the indicated National Codes and Standards.

Authorities having jurisdiction are to be consulted as to which type of roof deck construction is acceptable for specific locations before installation.

UPLIFT RESISTANCE CLASSIFIED

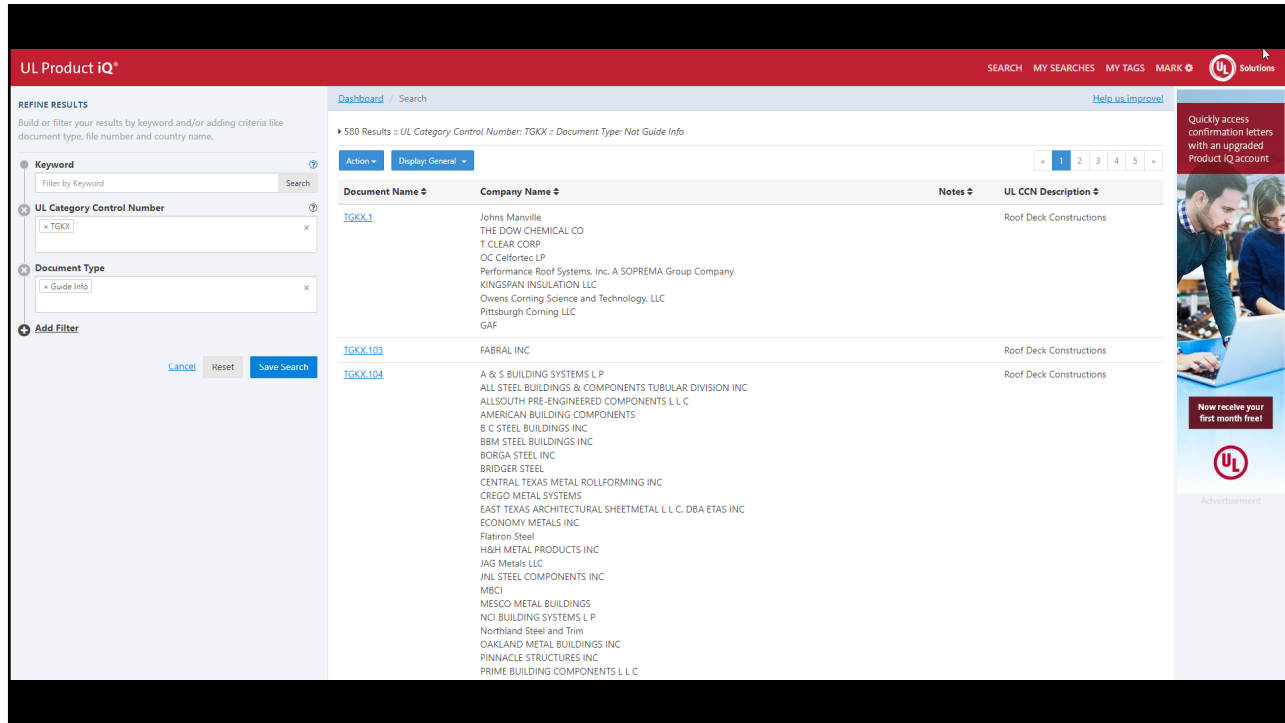
Roof Deck Constructions Classified for Uplift Resistance have been investigated for damageability from both external and internal pressures on the deck associated with high velocity winds. Uplift Classifications are derived from tests conducted in accordance with the Standard for "Tests For Uplift Resistance of Roof Assemblies", [ANSI/UL 580](#). The [ANSI/UL 580](#) test method subjects a 10 ft by 10 ft test sample to various static and oscillating air pressures to index performance under uplift loads imposed on roof decks.

The magnitude of the wind velocity across a roof deck and the resulting uplift pressures on a roof deck are dependent upon many factors such as wind gusts, the shape of the roof deck, edge configuration and the landscape surrounding the roof deck installation. A method to calculate the uplift pressures on roof decks is contained in the American Society of Civil Engineers (ASCE) Standard 7-95, Minimum Design Loads for Buildings and Other Structures.

The nominal static uplift pressure, the oscillating uplift pressures and the maximum static uplift pressure for each Class are:

Class	Nom Static Uplift Pressure psf	Range of Oscillating Pressure psf	Max Static Uplift Pressure psf
15	15	11 to 21	23
30	30	22 to 42	45
60	60	44 to 83	75
90	90	66 to 90	105

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4.2 Combustibility From Below the Roof Deck

Testing for combustibility from below the roof deck shall be in accordance with *Standard Method of Fire Tests for Determining the Heat Release Rate of Roofing Assemblies with Combustible Above-Deck Roofing Components*, NFPA 276 or in accordance with *Examination Standard for Class 1 Fire Ratings of Insulated Wall or Roof/Ceiling Panels, Interior Finish Materials or Coatings and Exterior Wall System*, FM Standard 4880.

4.2.1 Conditions of Acceptance for Combustibility from Below the Roof Deck

4.2.1.1 The roof assembly, when subjected to the NFPA 276 test, shall not exhibit fuel contribution rates in excess of the values shown in the following table.

Time Interval	Maximum Fuel Contribution Rate	
	Btu/ft ² /min	(kW/m ²)
3	410	(77.6)
5	390	(73.8)
10	360	(68.1)
Avg. (30 min)	285	(54.0)

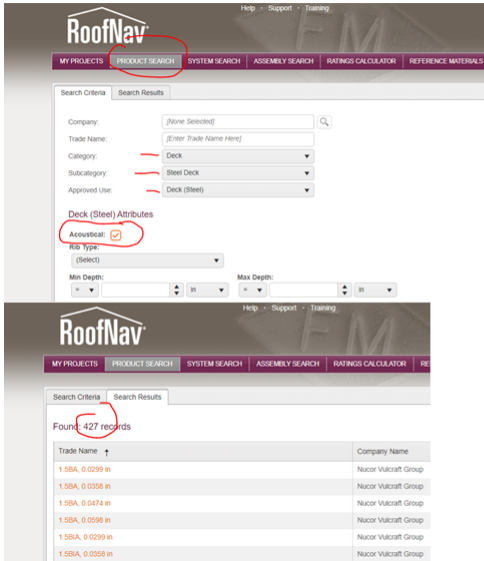
4.2.1.2 There shall be no dropping of flaming particles into the furnace or uncontrolled flaming on the exterior surface of the sample.

4.2.1.3 The roof assembly, when evaluated in accordance with *Approval Standard for Class 1 Fire Ratings of Insulated Wall or Roof/Ceiling Panels, Interior Finish Materials or Coatings and Exterior Wall System*, FM Standard 4880 shall meet the fire performance requirements of FM Standard 4880.

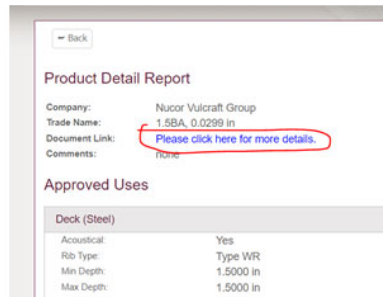
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For acoustical deck assemblies you need to look at the specific acoustical deck being used under the Products tab in RN. That will list the limitations on the deck. Not all require thermal barriers.



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Nucor Vulcraft Group 1.5BA, 1.5BIA steel deck steel roof deck is secured to structural supports. A minimum 1.5 in. (38 mm) thick polyisocyanurate insulation board is installed with edges along the centerline of the top flange and covered with an adhered roof covering or with mechanically attached roof covering when the in-row fastener spacing is less than or equal to one-half of the deck span, per proprietary listings.

Nominal 0.6 pcf (9.6 kg/m3) fiberglass insulation, 2.5 in. (64 mm) wide by 1.5 in. (38 mm) thick is placed within each lower flute. A minimum 0.5 in. (13 mm) Georgia-Pacific Gypsum Dens Deck thermal barrier boards** is required for asphaltic roofs.

**overlaid directly on the steel deck with edges along the centerline of the top flange of the steel deck

Meets wind rating per securement of the deck and securement of the above deck components.

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What do you think the roofing industry will look like in 2-3 years? Will we experience a backlash with suppliers increasing production with and a future reduction in demand?

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Other questions....

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